

What is claimed is:

1. An apparatus processing a substrate, comprising:
a heating process chamber in which a heating
process is performed for the substrate;
5 a load lock chamber, connected to the heating
process chamber, controlling at least oxygen
concentration and pressure;
a transferring arm transferring the substrate
between the heating process chamber and the load lock
10 chamber; and
a gate valve shielding the heating process chamber
from the load lock chamber.
2. The apparatus as set forth in claim 1, further
comprising:
15 a first exhausting portion vacuum exhausting the
heating process chamber;
a second exhausting portion normally exhausting
the heating process chamber; and
a selecting portion adaptively selecting the first
20 exhausting portion or the second exhausting portion and
causing the selected portion to operate.
3. The apparatus as set forth in claim 2,
wherein the first exhausting portion reduces an
inner pressure of the heating process chamber to around
25 1330 Pa or less, and
wherein the second exhausting portion reduces the
inner pressure of the heating process chamber to around

100000 Pa or less.

4. The apparatus as set forth in claim 1, further comprising:

5 a controller controlling the temperature of the heating process for the substrate in the heating process chamber.

5. The apparatus as set forth in claim 4, wherein the controller is capable of controlling the temperature in the range from 100°C to 800°C.

10 6. The apparatus as set forth in claim 1, further comprising:

a supplier supplying an inert gas to the heating process chamber.

15 7. The apparatus as set forth in claim 1, wherein the transferring arm has a temperature adjusting portion adjusting a temperature of the substrate placed thereon.

8. The apparatus as set forth in claim 1, wherein the load lock chamber has:
20 an opening through which the substrate is transferred to/from the outside, and

a shutter allowing the opening to be opened and closed.

25 9. The apparatus as set forth in claim 1, wherein the substrate is temporarily placed on the transferring arm in the load lock chamber when the heating process for the substrate is performed in the

100000 Pa or less.

500
700

Sub H2 heating process chamber in a changed processing condition.

10. The apparatus as set forth in claim 1, further comprising:

5 a supplier supplying an active gas to the load lock chamber; and

a sprayer spraying the active gas to a front surface of the substrate in the load lock chamber so as to reform the front surface of the substrate.

10 11. An apparatus processing a substrate, comprising:
a heating process chamber in which a heating process is performed for the substrate;

Sub H3
15 a load lock chamber, connected to the heating process chamber, controlling at least oxygen concentration and pressure;

a transferring arm transferring the substrate between the heating process chamber and the load lock chamber and performing a heating process for the substrate; and

20 a gate valve shielding the heating process chamber from the load lock chamber.

12. The apparatus as set forth in claim 11,

wherein the temperature of the heating process in the heating process chamber is higher than that of the heating process in the transferring arm.

25 13. The apparatus as set forth in claim 12,

Sub H4 wherein the temperature of the heating process in

the heating process chamber is in the range from 400°C to 450°C, whereas the temperature of the heating process in the transferring arm is in the range from 150°C to 250°C.

5 14. The apparatus as set forth in claim 11, further comprising:

118 a supplier supplying an active gas to the load lock chamber; and

10 a sprayer spraying the active gas to a front surface of the substrate in the load lock chamber so as to reform a front surface of the substrate.

15 15. An apparatus processing a substrate, comprising:

a heating process chamber in which a heating process is performed for the substrate;

15 a first exhausting portion vacuum exhausting the heating process chamber;

a second exhausting portion normally exhausting the heating process chamber; and

20 a selecting portion adaptively selecting the first exhausting portion or the second exhausting portion and causing the selected means to operate.

16. The substrate processing apparatus as set forth in claim 15,

25 wherein the first exhausting portion reduces the inner pressure of the heating process chamber to around 1330 Pa or less, and

wherein the second exhausting portion reduces the

inner pressure of the heating process chamber to around 100000 Pa or less.

17. The apparatus as set forth in claim 15, further comprising:

5 a controller controlling a temperature of the heating process for the substrate in the heating process chamber.

18. The apparatus as set forth in claim 15, further comprising:

10 a supplier supplying an inert gas to the heating process chamber.

19. The apparatus as set forth in claim 15, further comprising:

15 a supplier supplying an active gas to the load lock chamber; and

118 a sprayer spraying the active gas to a front surface of the substrate in the load lock chamber so as to reform the front surface of the substrate.

20. An apparatus processing a substrate, comprising:

20 a process chamber;

 a heating plate, disposed in the process chamber, performing a heating process for the substrate;

 a supplier supplying an inert gas, a reactive gas, or a liquid vaporous substance to the process chamber;

25 and

 a pressure reducing portion reducing an inner pressure of the process chamber.

21. The apparatus as set forth in claim 20, further comprising:

a controller controlling the supplier and the pressure reducing portion so that the oxygen
5 concentration of the process chamber decreases at a velocity in the range from around 6000ppm/second to 20000ppm/second.

22. A method processing a substrate, comprising the steps of:

10 (a) raising a temperature of the substrate to the predetermined temperature at which a heating process is performed for the substrate and decreasing an oxygen concentration in an area of which the substrate is processed at a velocity in a range from around
15 6000ppm/second to 20000ppm/second; and

(b) performing the heating process for the substrate at the predetermined temperature in the area with a decreased oxygen concentration.

23. The substrate processing method as set forth in
20 claim 22,

wherein the step (a) is performed by decreasing the oxygen concentration of the area in which the heating process is performed for the substrate at a velocity of around 10000ppm/second.

25 24. The method as set forth in claim 22,

wherein the step (a) is performed by reducing an inner pressure of the area while an inert gas, a

reactive gas, or a liquid vaporous gas is being supplied to the area so as to decrease the oxygen concentration of the area.

25. The method as set forth in claim 22,
5 wherein the step (a) includes the step of:
increasing the oxygen concentration of the area.

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